Minneapolis
City of Lakes

SEH

Resource Recycling Systems
Sustainable Systems for a Waste-Free Future

CITY OF MINNEAPOLIS
DUAL/SINGLE SORT COLLECTION STUDY

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INTRODUCTION

- The State of Minnesota has established recovery goals for Hennepin County, which includes a 45% recycling rate by 2015 and 47% by 2020.
- The State of Minnesota and Hennepin County require collection programs that are either dual sort or single sort
- Hennepin County approved a Resolution to Establish Recycling Goals and revised the Funding Policy for Recycling Grants.
  - A 35% Recycling Rate was established to qualify for funding under the Residential Recycling Funding Policy for the City of Minneapolis, which is consistent with the City Sustainability Goals.

BACKGROUND

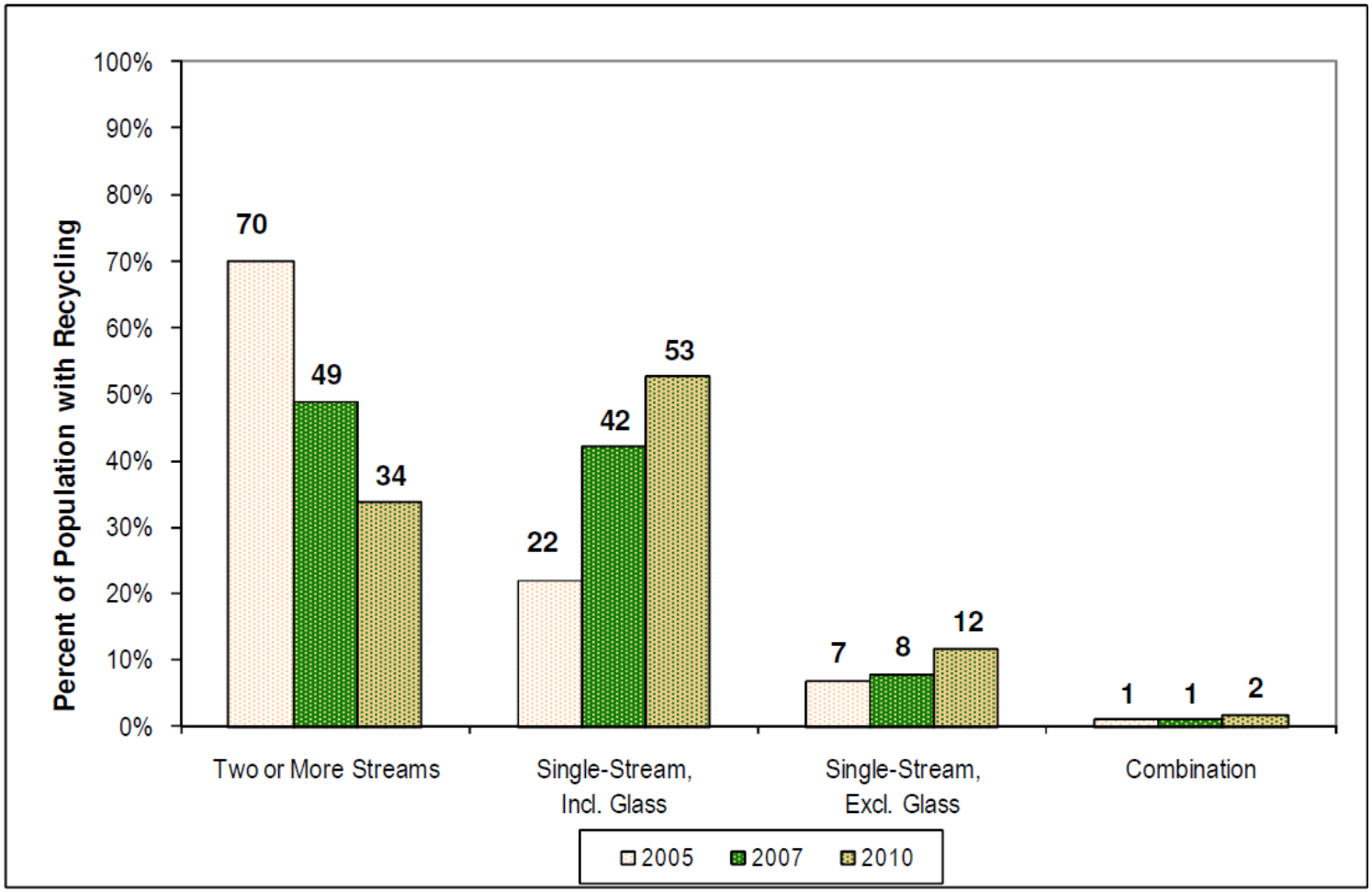
- Minneapolis program is a curbside multi-sort program that has been in existence for over 23 years.
- Collection quantities are limited in Multi-sort programs by complex sorting requirements for residents

- Although the community accepts and supports recycling, for more than 10 years the city has seen a stagnant recycling rate, and in some years, the rate has declined.

POTENTIAL PROGRAM IMPACTS

- If Minneapolis switched from the current multi-sort system to dual or single sort, what could the city expect in the areas of:
  - Cost Effectiveness
  - Convenience for Residents
  - Environmental Impact
    - Diversion rate
    - Contamination
    - Market Impact

NATIONAL TRENDS



In 2010, 64% of American households had access to single sort recycling

COMPARISONS AND RECYCLING RATE

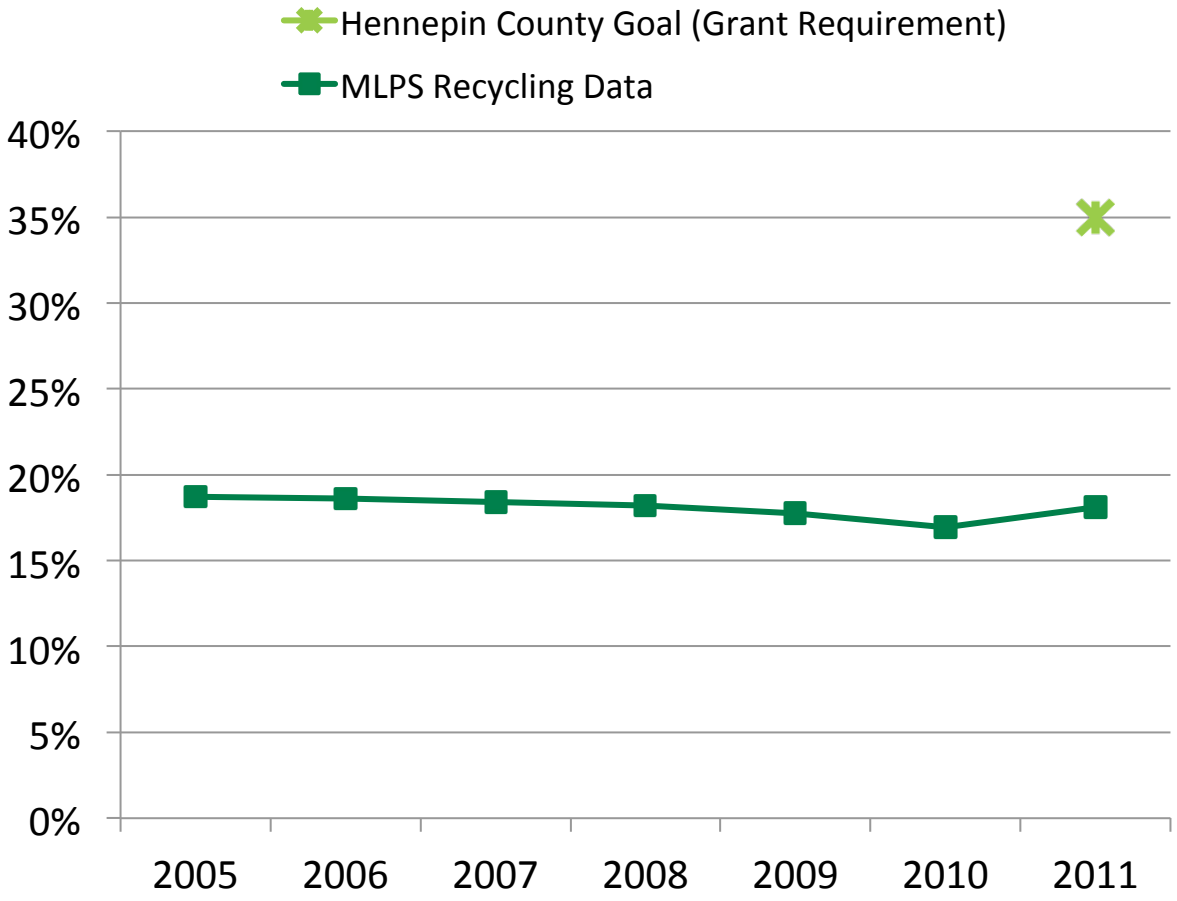
- **Minneapolis:** Current program and dual/single sort pilot programs
- **St. Paul:** Converted from source separated to dual sort in 2001.
- **Ann Arbor:** Converted from multi sort to dual sort in 1995, converted to single sort in 2009
- **Portland:** Converted from multi sort to dual sort in 1999
- Other Cities including **Cincinnati**, **Kansas City**, **Toledo**

City	Recycling Rate*
Current MPLS	18%
St. Paul	**30%**
Ann Arbor	**37%**
Portland	**34%**
Kansas City**	16%
Cincinnati**	18%

* Recycling Rate calculated by dividing total recyclables by total waste (trash + recyclables), excluding yard waste

** Kansas City and Cincinnati do not collect yard waste separately

MINNEAPOLIS RECYCLING RATE



2011 Hennepin County Recycling Rate of 35%

2011 Recycling Rate = 18.1%

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SINGLE AND DUAL SORT PROCESSING

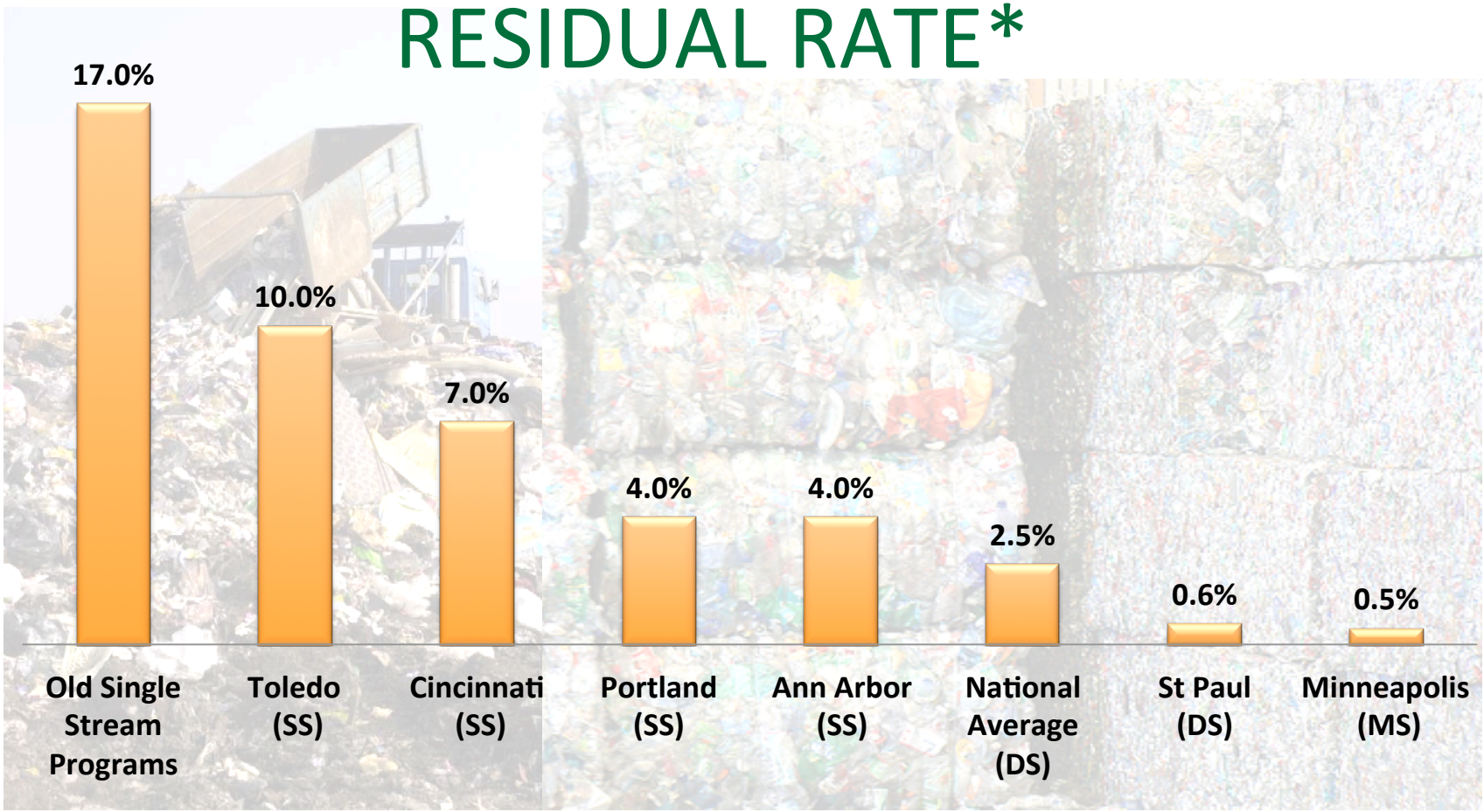
- Significant increase in system capabilities in the past 5 years has reduced recyclable material lost during processing (Residuals)

Improved screens, optical sorters and front end metering to separate fibers and containers

Glass Removal up front to reduce contamination

More plastics are recyclable

MATERIAL RECOVERY FACILITY (MRF) RESIDUAL RATE*



- Residual rate is the amount of material thrown out at the recycling facility and is composed of:
  - Non-recyclable materials and
  - Recyclable materials that weren't sorted correctly

FINDINGS FROM OTHER PROGRAMS

- Peer cities programs have moved away from source separation
- Material diversion is almost double in peer communities with single-sort and fifty percent higher with dual sort
- Single sort programs can produce high quality material with good education program
- Markets for materials accept residue as cost of doing business
  - Material Recovery Facilities (MRFs), End Markets (Mills) and Producers continually improving technology to produce high quality material for markets.

BEFORE & AFTER

- Ann Arbor
  - Saw 15% increase in tonnage with switch from dual stream bins to single stream carts
- St. Paul
  - Saw 15% increase in tonnage with switch from source separated biweekly bins to dual stream weekly bins
- Cincinnati
  - Saw participation increase from 40% to 71% with switch from weekly bins to biweekly carts
  - Tonnage increased by over 50% in same time period
  - Switch saved city $900,000 per year

MINNEAPOLIS PILOT COLLECTION RESULTS

Program	Increase in Stops	Increase in Weight	Avg. lbs./HH/Yr.
Single Sort			
High Performing Neighborhood	**34.6%**	**31.0%**	**592**
Low Performing Neighborhood	**74.6%**	**77.0%**	**338**
Dual Sort			
Average Performing Neighborhood	**92.6%**	**28.8%**	**474**
Current for Participating HH			405
Current for All Dwelling Units (DU)			**343**
St. Paul, MN All Dwelling Units			430
Portland OR			659
Ann Arbor, MI			726

OPTIONS ASSESSMENT

- Single and Dual Sort Collection
  - Automated and Semi-Automated Trucks
  - Side Load and Rear Load
  - Bi Weekly or Weekly
  - 96, 64 and 32 gal curb carts
  - Lbs. per Household (HH)
- Alley Collection and Constraints
  - Narrow (12-14 feet)
  - Winter Snow
  - Short Turn Radius

TYPES OF TRUCKS

Dual or Single Sort Options

Semi-automated
Currently Used for
Waste Collection

Single Sort Options

Automated

Dual Sort Options

Semi-Automated or
Fully-Automated

All trucks are compacting

BINS VS. CARTS

	Bin		Cart		
	Cost/HH	Lbs/HH	Cost/HH	Lbs./HH	Total Capital (Carts & Trucks)
Current	$32.21	343			
Dual Stream Bi-weekly			$34.81	500	$12.9 M
Single Stream Bi-weekly			$31.67	600	$8.8 M

- Dual stream assumes all households get 1 64-gal and 1 32-gal carts
- Single stream assumes all households get 1 64-gal or 1 96-gal cart (optional)

FOCUS GROUP FEEDBACK

- Make the Program Simple and Easy
  - Make it Weekly Like Trash Pickup if not too costly
- Keep Collection in the Alleys
- Strong Support for Single Stream
- Add as many additional materials as possible
  - Adding Cartons was a huge improvement
  - Plastic Films
  - Rigid Plastics (Plastic lawn furniture)
  - Pizza Boxes and Other coated paper like freezer boxes
- Enhance Education
  - Info about what can be recycled on Cart with pictures
  - Household Brochure that explains recycling with pictures

MOVE TO DUAL AND SINGLE SORT

- Reinvigorate Recycling Program
- More Efficient Collection
- Possible Routes Reduction
- Easily Add Materials
- Expand Program without Increasing Operating Costs
- Reduce Waste Disposal Costs
- Engages Regional Material Processors
- Commercial & Multi-family Is Easily Integrated
- Compatible with Cart Based Yard and Food Waste Collection

PROGRAM PERFORMANCE

Options	Current Multi-Sort Baseline	Single Sort Semi Auto Biweekly	Single Sort Semi Auto Weekly	Dual Sort Semi Auto Biweekly	Dual Sort Semi Auto Weekly
Size of Cart (gals)		96	64	2 x 64	1x64 1x32
Number Carts		105,226	105,226	210,452	210,452
Number of Trucks (incl. extra)	16	8	15	9	17
Number of Staff	15	16	30	18	34
lbs./HH/Year	405	600	600	500	500
lbs./HH/Stop	15.6	23.1	11.5	19.2	9.6
CityTons per Year (Participating HH)	9,010	14,200	14,200	11,834	11,834
City+MRI Tons per Year (Participating HH)	18,026	28,411	28,411	23,676	23,676
Recycling Rate Percentage* (Rec/MSW)	18.1%	31.9%	31.9%	25.2%	25.2%

* A Recycling Rate Percentage of 35% is achieved with 650 lbs./HH/Year

BUDGET IMPACT

Program Area	Current Multi-Sort Baseline	Single Sort Semi Auto Biweekly	Single Sort Semi Auto Weekly	Dual Sort Semi Auto Biweekly	Dual Sort Semi Auto Weekly
Labor with Benefits	$1,031,338	$1,098,333	$2,036,263	$1,232,323	$2,304,243
O&M	$488,400	$293,200	$464,000	$324,600	$519,800
Education	$0	$100,000	$100,000	$100,000	$100,000
Customer Service	$174,537	$174,537	$174,537	$174,537	$174,537
Total City Collection Cost	($1,694,275)	($1,666,070)	($2,774,800)	($1,831,460)	($3,098,580)
MRI Collection	($1,694,593)	($1,666,371)	($2,775,301)	($1,831,791)	($3,099,139)
Total Collection Cost	**($3,388,868)**	**($3,332,441)**	**($5,550,101)**	**($3,663,251)**	**($6,197,719)**
$/ton All HH and Tons	($188)	($117)	($195)	($141)	($262)
Cost/HH	($32.21)	($31.67)	($52.74)	($34.81)	($58.90)
Cost/HH/Month	($2.68)	($2.64)	($4.40)	($2.90)	($4.91)

MARKET IMPACT

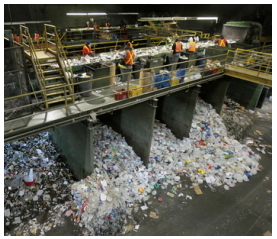
- No evidence of decreased prices paid for single or dual sort material with performance based processing contract, but processing fees differ based on program type
- No difficulty for facilities to move material to market
  - Strong demand from established regional/domestic markets for all materials
- Processing fees for single and dual sort MRFs range from $60 - $80 per ton
  - Revenue above processing fee is split between MRF processor and City
  - More efficient to sort material in a central location than on the curb

PROGRAM IMPACT:
WASTE COLLECTION SAVINGS AND REDUCTION IN RECYCLING TRUCKS

- Single Sort Collection is Lowest Cost Option
- Cost Savings on Trash Collection
  - Higher Residential Recycling Rate Creates:
    - Less trash on refuse routes
    - Lower trash set-out rates on refuse routes
    - Greater efficiencies in collection
  - One Truck Can Service 2 Current Recycling Routes
    - 7 Trucks can be eliminated due to higher efficiency of collection reducing annual cost of capital for trucks
    - Possible Phase-in during 2013

PROGRAM CHANGES

30% - 60% increase in recovery



Increase in processing fees

Reduced collection costs

Increase in capital cost for new carts

Avoided tip fees & Potential solid waste route savings

Can switch to commingled program without increasing recycling costs

WHAT CAN MINNEAPOLIS EXPECT

Variable	New Minneapolis Recycling Program
Collections	Increase citywide recycling weight by minimum 30% to 60%
Average Commodity Prices	Similar to current program commodity prices (Market Based)
Processing Costs	Estimate $60 to $80 per ton.
Residual Rates	2.5% to 4%
Avoided Tipping Fees	Saves the city $47/ton
Operational Costs	Single Sort Most Efficient. Operational Impact Needs Market Verification though Request for Proposal (RFP) Bid Information.

BRING IT ALL TOGETHER

Options	Current Multi-Sort Baseline	Single Sort Semi Auto Biweekly	Single Sort Semi Auto Weekly	Dual Sort Semi Auto Biweekly	Dual Sort Semi Auto Weekly
City Collection	($1,694,275)	($1,666,070)	($2,774,800)	($1,831,460)	($3,098,580)
Includes Additional Education		($100,000)	($100,000)	($100,000)	($100,000)
MRI Collection	($1,694,593)	($1,666,371)	($2,775,301)	($1,831,791)	($3,099,139)
Total Collection Cost	**($3,388,868)**	**($3,332,441)**	**($5,550,101)**	**($3,663,251)**	**($6,197,719)**
$/ton	($188)	($117)	($195)	($141)	($262)
Material Revenue*	$1,640,937	$1,280,504	$1,280,504	$1,173,796	$1,067,087
Net City Recycling Costs minus Rec Revenue	**($1,747,931)**	**($2,051,937)**	**($4,269,597)**	**($2,489,455)**	**($5,130,633)**
Net Cost per ton w/Revenue	($97)	($72)	($150)	($96)	($217)
Value of MSW Diverted	$847,231	$1,335,318	$1,335,318	$1,224,041	$1,112,765
Net City Recycling Costs (Annual Cost -MSW Diverted Savings	**($900,701)**	**($716,619)**	**($2,934,279)**	**($1,265,414)**	**($4,017,868)**
Cost per City Recycled Ton	($50)	($25)	($103)	($49)	($170)

* Assumes a Processing cost = $70.00
* Baseline Processing Cost = $24.04

It's possible to switch to a commingled program without increasing recycling costs and a possibility to reduce net costs

CONCLUSIONS

Single sort provides the greatest opportunities for increasing recycling at same or lower cost.

- **Most Cost Effective and is Compatible with the Current Waste Collection Fleet**
  - Minimum 20% below current net cost including revenue while achieving a 32% Recycling Rate
- **Highest Convenience and Most Compatible with Organics Collection**
  - Multi-Family more Easily Integrated into System
- **Environmental Impact**
  - Highest Diversion Rate
  - Slight Increase in Contamination that can be Managed with Education Program
  - Minimal Market Impact with Performance Based Processing Contract (Residual Rate, Audits, Inspections, Market Verification)
  - Possible Net GHG Reduction from Current System

QUESTIONS

Thank you for your Attention

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